



Making Sense of Laser-Markable Metals

Ready to test your metal? Pick the right one for the job

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More engraving shops are now using metals for high-end applications such as corporate awards, diplomas, newspaper reproductions, industrial labels and wayfinding signage. Contrary to popular belief, laser-markable metals are sometimes less expensive than engravable plastics. When they are more expensive than other materials, the extra cost may not be an issue if the high perceived value of metals makes it possible for you to charge more for the finished product. Laser-markable metals are used because of their durability and perceived value, both of which can increase business. Various laser-markable metals are imaged differently (with a CO₂ laser) and used for assorted profitable applications.

Metal Types

Laser-markable metals (LMMs) refer to those materials that appear metallic and can be marked with a CO₂ laser. Fiber lasers and nD YAG lasers mark more metals but are less common in recognition shops. LMMs are best categorised by the four ways they are marked by a CO₂ laser:

- Engraving: The surface colour is ablated or burned away by the laser (FIGURE 1). **Examples:** Rowmark Metalgraph Plus, IPI LaserMetallic Brush, lacquered aluminium, Laser-It, DuraBlack.
- Bleaching: The metal is turned white by the heat of the laser (FIGURE 2). **Examples:** Black anodised aluminium, LazerWhite.
- Ceramic bonding: A coating is sprayed onto the metal and bonded by the heat of the laser. (FIGURE 3). **Examples:** CerMark, TherMark.
- Positive image transformation: Pre-coated metal is imaged through a chemical transformation on its surface (FIGURE 4). **Examples:** AlumaMark and laserable anodised mirrored aluminium (LAMA).



FIGURE 1



FIGURE 2



FIGURE 3



FIGURE 4

Choosing a Metal

Each metal and marking method has pros and cons, making the most important consideration the look and feel of the finished product. Your customer doesn't care how you engrave the plaque as long as the finished product looks amazing. Three factors must be taken into account when selecting an LMM:

1. **Base Material:** What is the material made of? LMMs are made of aluminium, steel, brass, or even plastic that looks like metal. Each has its place, but you need to consider which material your customers expect for a particular application.
2. **Mark Appearance:** Most LMMs appear metallic, though some are dyed or painted to have a non-metallic colour. When imaged with a CO₂ laser, some form a black 'positive' mark (black mark on metallic background) and some are imaged to a white 'negative' mark (white mark on a black or metallic background). The marks are shown in FIGURE 5. Choose the material that creates the appearance best suited to each customer's needs.
3. **Durability:** We are conditioned to think that if something is metal, it is durable. That is simply not the case for LMMs. Some are certified for outdoor use; some are not. When picking a durable LMM, be sure you find one made for outdoor application. If you plan to work with industrial or military suppliers, make sure your LMM is military specified.

After you have identified an LMM that meets your requirements for material, duality and appearance (FIGURE 6), you can then focus on how to mark them with a CO₂ laser.

Start your Lasers

All lasers are different. Even if you have two identical models from the same manufacturer, you may find differences between the speed and power required for a certain material. Power settings will also be affected by how long your laser has been running that day.

The settings common to all lasers are power, speed and dots per inch (DPI). When choosing settings, refer to the instructions provided by the manufacturer of the LMM. Many manufacturers provide laser settings on their websites.

As a starting point, DPI should be set to 600 or higher. Likewise, the speed can be set at 80 percent for most lasers. All that remains is power. Here are settings that we found worked well on our 35-watt laser. Again, every

FIGURE 5

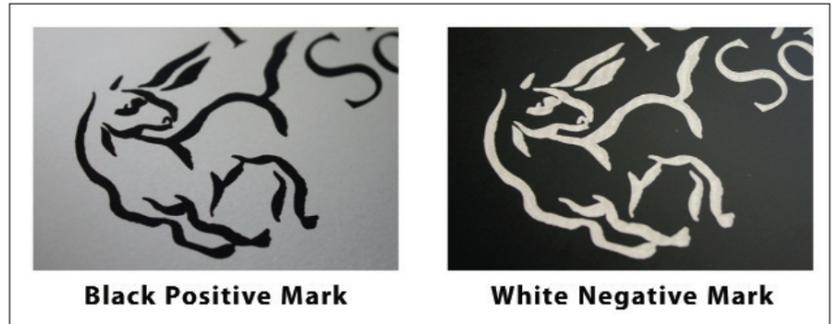


FIGURE 6

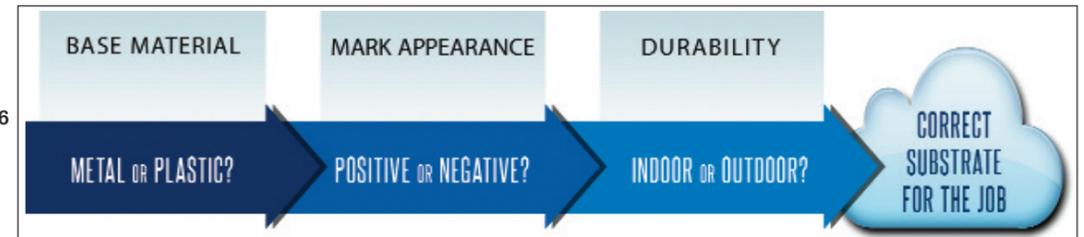
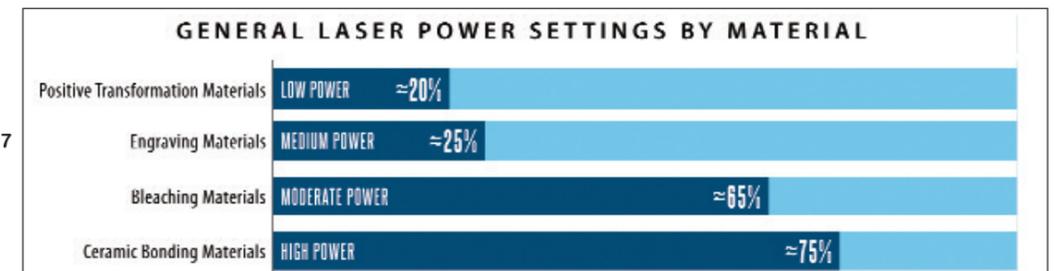


FIGURE 7



laser is different so use the settings in FIGURE 7 as suggested starting points, but refer to the manufacturer's guide to fine-tune them.

Some materials require product-specific adjustments. The recommended starting point for lasering JDS Industries' LazerBlak is 10 percent less power than laser manufacturer's settings for painted brass. We have gotten good results with a 2 percent setting for LazerBlak. For Horizon's AlumaMark, try taking the laser out of focus 1/8 in. by simply adding 1/8 in. to the material thickness for your z-axis (bed height). For a .02-in. thick material, for instance, the z axis would be set at .145 in.

Making Money

Using metals can add value to your current offerings or allow your shop to enter new markets, such as those shown in FIGURE 8 and FIGURE 9.

FIGURE 8

	Real Metal	Positive Black Image	Outdoor Durable
Traditional Items	Maybe	Yes	No
High Quality Reproductions	Yes	Yes	Maybe
Corporate Recognition	Yes	Yes	Maybe
Durable Items	Maybe	Maybe	Yes



FIGURE 9

Corporate recognition jobs can be especially beneficial if they are 'annuities.' These opportunities for repeat business come with awards that are given out more than once, such as those recognising employees' work or donors' philanthropy.



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